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31 DEC' 02



AMERICAN VITRIFIED CONDUIT COMPANY

GENERAL OFFICE
39-41 Cortlandt St.
New York



R. C. PENFIELD,
President.

R. W. LYLE,
Sec'y and Manager.

W. J. BURKE,
Treasurer.

AMERICAN VITRIFIED CONDUIT COMPANY.

Vitrified Salt Glazed Underground
and Interior Conduits.

Contractors for Complete Installation of
Conduit Systems.

GENERAL OFFICE:

39-41 CORTLANDT STREET,
NEW YORK.

Long Distance Telephone,
128 CORTLANDT.

First Edition, May, 1899.

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COMPANY, in the office of the Librarian of Congress at Washington, D. C.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



"Our Standard Types of Multiple and Single Duct Conduits."

INTRODUCTION.



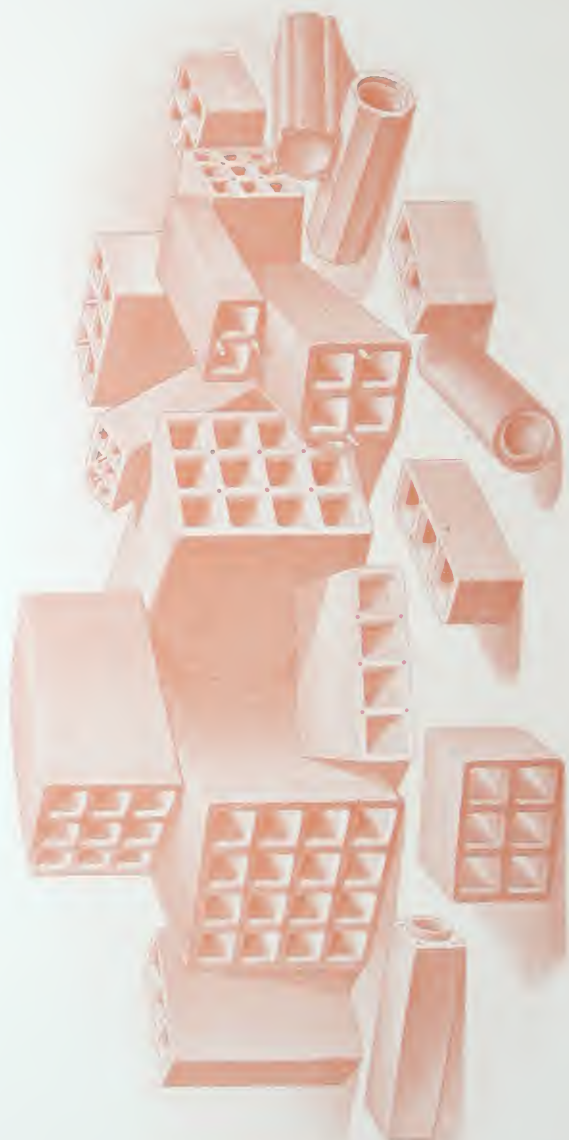
I N presenting this Illustrated Catalogue to the attention and consideration of those about to install a Conduit System or enlarge their present one, we do so believing it will prove of value and interest. Leading to the endorsement and adoption of our system of VITRIFIED GLAZED Tile Conduits as being the standard of all underground construction work.

We have developed and perfected from a varied, extensive and practical experience, under all conditions and tests, both in the manufacture of material and the construction of same, the most perfect and complete Underground Conduit System yet offered; meeting every requirement of Trunk, Feeder and Distributing Lines for Electric Light and Power, Electric Railway, Telephone, Telegraph Service or any other purpose for which conduits are required.

DURABILITY.

The history of all ages in the manufacture of clay and pottery ware has established the unquestionable and indisputable fact of the absolute indestructibility and superiority of Vitrified Glazed Tile Conduits over those manufactured from other materials.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



"Our Standard Types of Conduits in Long and Short Lengths."

AMERICAN VITRIFIED TILE CONDUITS.



They are manufactured from a thoroughly mixed and ground combination of stoneware-clay, fire-clay and spar by machinery, specially designed for our various kinds and types, and are carried through a process of manufacture extending over three weeks of drying, burning, glazing and cooling; the result being the production of a perfect conduit.

COMPARATIVE POINTS.

Perfect alignment;

Freedom from deterioration;

Smoothest possible surface;

Least frictional resistance;

High insulating properties;

Fire, Acid, Gas and Water-proof;

Absolutely no repairs or renewals;

Flexibility in getting around obstructions;

Protection from short-circuiting and grounding;

Best mechanical and electrical protection;

Absolute strength against breakage;

Always accessible;

Fire-proof.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



"Our Standard Types of Single Duct Conduits."

TYPES OF CONDUITS.



With our various combinations of single and multiple ducts we meet all requirements, and in addition thereto make any special type which may be required.

DIMENSIONS.

Our standard lengths for our Multiple Conduits are two to four feet. Special lengths, four to six feet. Short lengths for fitting into man-holes, etc., without cutting, six to eighteen inches. Single Duct Standard, eighteen inches; short lengths, six, nine and twelve inches. See page 11 for details.

MANUFACTURING CAPACITY.

We have practically unlimited manufacturing capacity, and carry a large stock at all times of our Standard Types of Conduits.

SHIPMENT.

Our factory on the Raritan River at Perth Amboy, N. J., gives us every advantage, both as regards facilities in shipping and freight rates by water or railroad, via Penn. R. R.—N. J. Central—B. & O. R. R.

PATENTS.

All our Types of Conduits are covered by strong, fundamental patents, also on Service and Distribution details.

ENGINEERING AND DESIGNING.



We maintain an efficient force of engineers, and have retained the ablest of Consulting Engineers of large experience. We place this department at the service of our customers to advise, plan or supervise the designing and construction of Conduit Systems complete, including Subway Systems for Cities.

CONSTRUCTION AND CONTRACTING.

We contract for complete installation or supervision of construction for entire systems, or furnish Superintendents to supervise the installation. We prepare plans and specifications and act as Supervising Engineers.

AMERICAN VITRIFIED CONDUIT CO.

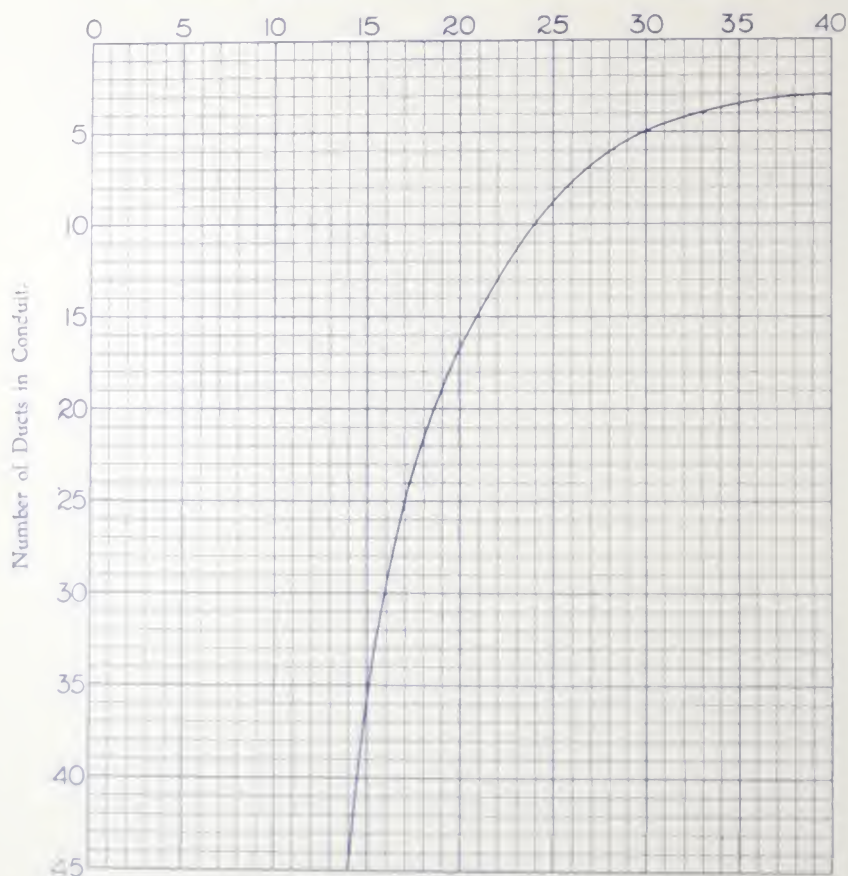


"Making Joint on Multiple Duct Conduit."

The Conduits are centered with two dowel pins at each joint, and then wrapped with a six inch strip of asphalted burlap or with a six inch strip of damp cheese cloth and given a coating of cement mortar.

SINGLE DUCT CONDUIT JOINTS.—Being Self-Centering, are simply socketed one into the other.

TABLE OF
COST IN CENTS PER DUCT FOOT
FOR INSTALLING
AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS.



The above Curve shows cost of Conduit Systems, per Duct foot, average City conditions, with block or brick pavement on concrete base, including trenching, paving, concreting, laying, conduits.

Vertical lines represent Cents. Horizontal lines represent number of Ducts.

TABLE
GENERAL DATA ON STANDARD CONDUITS
OF
AMERICAN VITRIFIED CONDUIT COMPANY.
THREE INCH DUCTS.

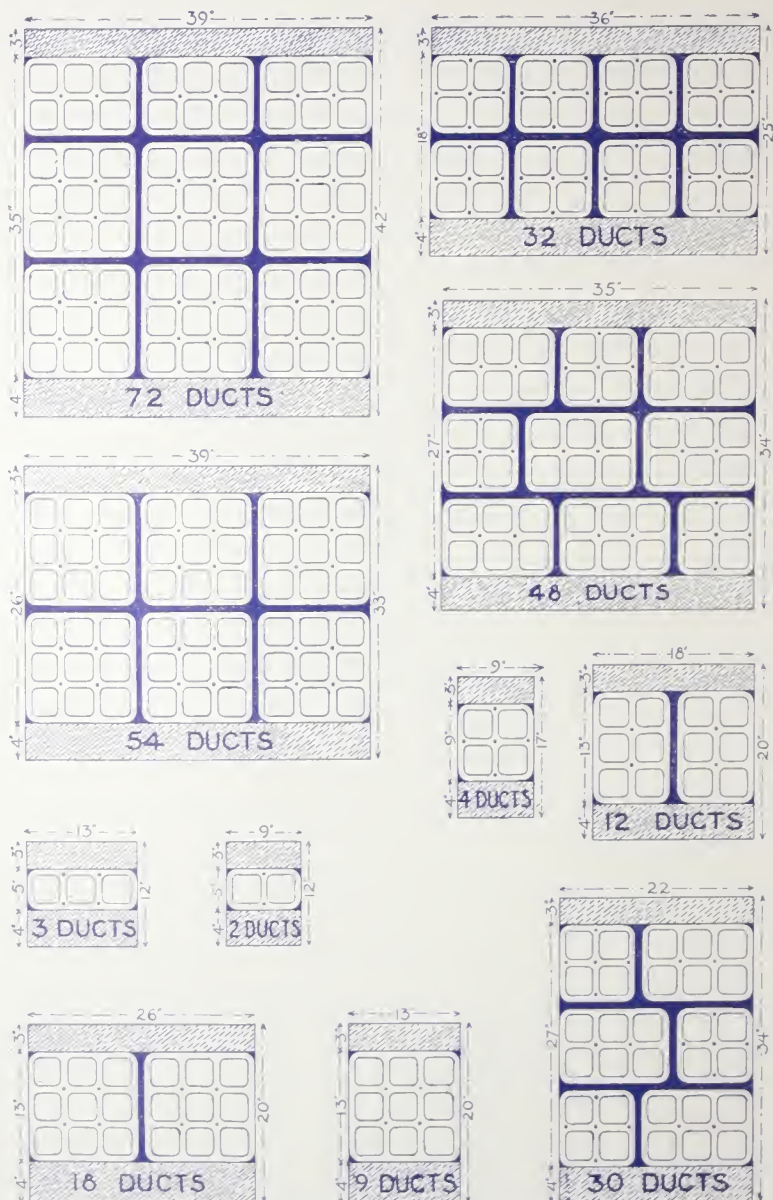
Type of Conduit.	Height and Width or Size of End Section in Inches.	Standard Lengths in Inches.	Special Short Lengths in Inches.	Approx. Weight per Duct Foot
Single Dowel . .	4 ¹ / ₄ x 4 ¹ / ₄	18	6 and 12	10 lbs.
Square, Self-Centering	5 x 5	18	6 and 12	14 "
Round, "	4 ⁷ / ₈ diameter	18	6 and 12	10 "
Octagon, "	4 ⁷ / ₈ "	18	6 and 12	10 "
Two Duct . . .	4 ⁵ / ₈ x 8 ³ / ₄	24	6 and 12	8 ³ / ₄ "
Three Duct . .	4 ⁵ / ₈ x 13	24	6 and 12	8 ¹ / ₂ "
Four Duct . . .	4 ³ / ₄ x 8 ³ / ₄	*36 and 48	6, 9 and 12	8 "
Four Duct . . .	4 ³ / ₄ x 17	24	6 and 12	8 "
Six Duct	8 ³ / ₄ x 13	*36 and 48	6, 9 and 12	8 "
Nine Duct	13 x 13	36	6, 9 and 12	7 ¹ / ₄ "
Twelve Duct . .	13 x 17	30	6, 9 and 12	7 ¹ / ₂ "
Sixteen	17 x 17	30	6, 9 and 12	7 ¹ / ₄ "

TWO INCH DUCTS.

Type of Conduit.	Height and Width or Size of End Section in Inches	Standard Lengths in Inches	Special Short Lengths in Inches.	Weight per Duct Foot.
Six Duct	6 x 9	36		4 ¹ / ₂ lbs.
Nine Duct	9 x 9	36		4 ¹ / ₄ "

*Special Long Lengths, 72 Inches.

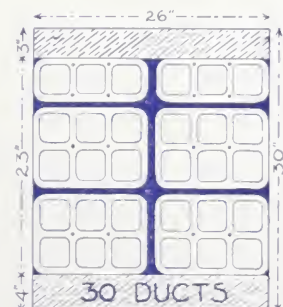
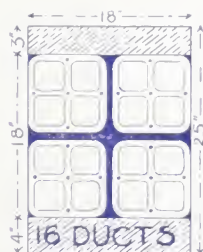
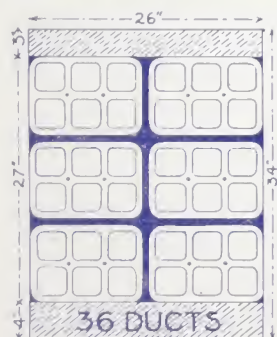
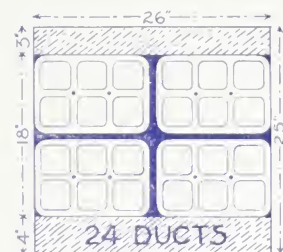
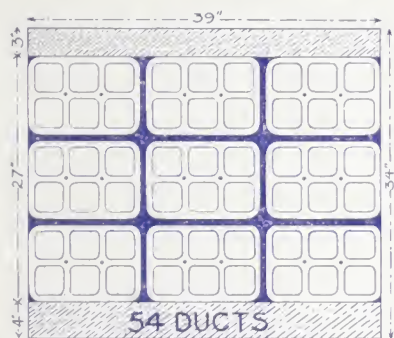
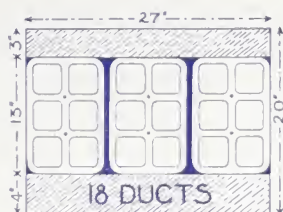
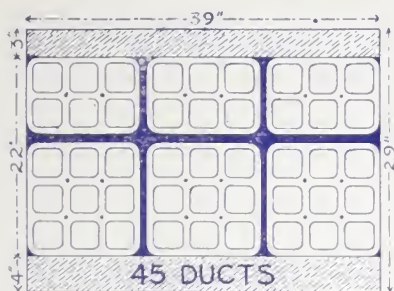
AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS.



IF SIDE CONCRETE IS USED ADD 6" TO MEASUREMENT FOR WIDTH.

Diagrams showing space occupied by Conduit Systems from one to seventy-two Duct Conduits.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS.



IF SIDE CONCRETE IS USED ADD 6" TO MEASUREMENT FOR WIDTH

Diagrams showing space occupied by Conduit Systems from one to seventy-two Duct Conduits.

MEMORANDUM FOR SPECIFICATIONS ON CONDUIT LAYING.

CLASS A.

After the trench has been excavated and the bottom carefully levelled, a bed of concrete shall be laid on same, and well rammed, with a width equal to the width of the conduits to be laid on same and of an average thickness of three inches. After the conduits have been laid in position and joints made, a two inch covering board or plank shall be laid on top for the width of the conduits. Plank may be hemlock, spruce, pine or cypress, of a fair quality and reasonably straight. The earth to be then filled in on sides and top and well rammed or puddled. (See illustration, page 19.)

CLASS B.

After the trench has been excavated and the bottom carefully levelled, a bed of concrete shall be laid on same, and well rammed, with a width equal to the width of the conduits to be laid on same and of an average thickness of three inches. After the conduits have been laid in position and joints made, a two inch layer of concrete shall be placed on top of conduits for their width. The earth shall be filled in on sides and top and well rammed or puddled. (See illustrations, pages 16 and 20.)

CLASS C.

After the trench has been excavated and the bottom carefully levelled, side boards of one inch spruce, pine or hemlock of fair quality, with strips nailed on back of same, shall be placed in position at the two sides of trench at a distance apart of six inches more than the width of con-

duits, and seven inches higher than the height of conduits to be laid in same. Nailing pieces 1x2 inches shall be secured to the two sides about every eight feet on top and bottom across the trench where required to hold the side boards in place. (Shown in illustration, pages 26 to 30.)

A bed of concrete averaging 4 inches thick shall be then placed in bottom of trench for the width between the side boards. On this the conduits shall be laid and joints made, and conduits carefully centered to give a width of three inches on sides between conduits and side boards. The sides and top shall then be filled up with concrete to make a complete concrete envelope around conduits, with a thickness of four inches in bottom and three inches on sides and top. (As shown on pages 17, 18, 21 and 22.)

CLASS D.

Same as Class C, with the addition of one inch boards in bottom of trench to lay concrete on, to be used where necessary to secure bottom for concrete, as at New Orleans.

CONCRETE.

The concrete shall be cement concrete made as follows: One part natural cement (Hoffman, N. Y. Bridge Brand, Improved Union or equal thereto), two and one-half parts of clean, sharp sand, and five parts screened gravel, crushed stone, ashes or furnace slag, and to be small enough to pass through 1½ inch mesh.

CEMENT MORTAR.

Cement Mortar shall be composed of one part natural cement (Hoffman, N. Y. Bridge Brand, Improved Union or equal thereto), two and one-half parts of clean, sharp sand.

MAKING JOINTS ON CONDUITS.

(See description, page 9.)

SECOND SECTION—CONSTRUCTION.

In the following pages are illustrated our standard methods of building Conduit Systems; each one having its use under the conditions indicated, typifying them as best illustrating the different and varied conditions met with in practice. Following them with photographs of various illustrative and prominent contracts.



Octagon Single Duct Self-Centering Type, with Concrete Base and Cover.
Class B. Construction.

All our Single Ducts are of the Self-Centering or Socket Type, assuring a positive joint and perfect alignment.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



Round, Single Duct, Self-Centering Type, with complete Concrete Envelope.
Class C. Construction.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.

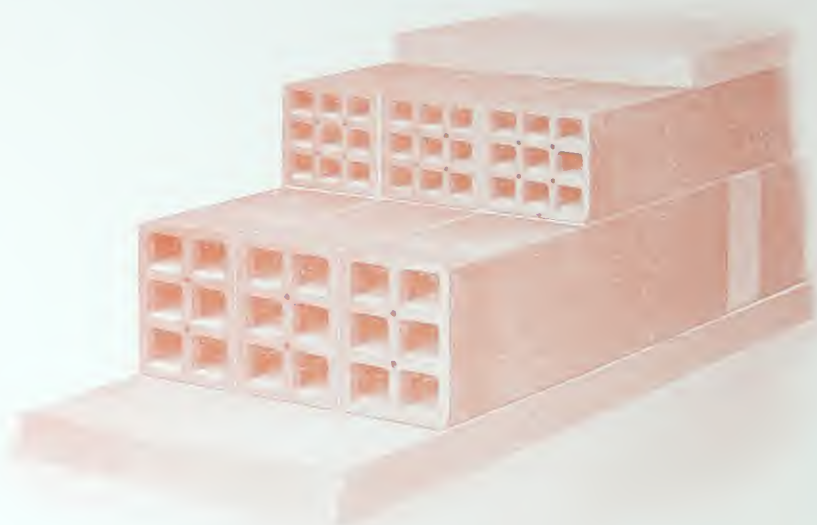


Square, Single Duct, Self-Centering Type, with complete Concrete Envelope.
Class C. Construction.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



Multiple Duct Conduits, with Concrete Base and Plank Covering Board.
Class A. Construction.



Multiple Duct Conduits with Concrete Base and Cover.
Class B. Construction.



Multiple Duct Conduits, with complete Concrete Envelope,
Class C. Construction.



Multiple Duct Conduits, with complete Concrete Envelope on Plank Base,
Class D. Construction.

CONDUITS OF AMERICAN VITRIFIED CONDUIT CO.



Multiple Duct Conduits, with complete Concrete Envelope.
Class C. Construction.

CONDUIT SYSTEM
OF THE
Narragansett Electric Light Co.,
PROVIDENCE, R. I.

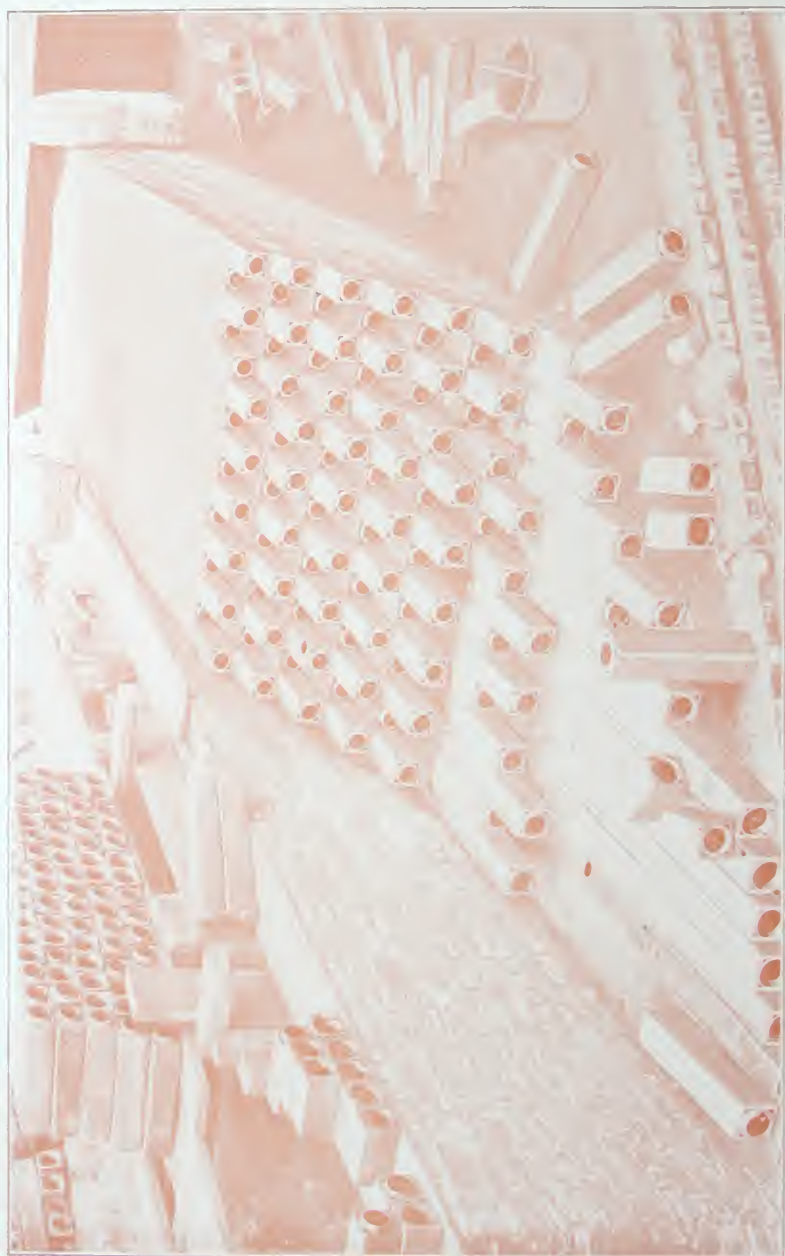
MARK LOWD, ENGINEER.

American Vitrified Conduit Co., General Contractors for the System, complete for the whole City, over 1,200,000 feet of Conduit.

On the following pages we give some typical illustrations of this work, as being one of the most complete and largest Conduit Systems ever contracted for, and is to be completed within one year from date of contract.

The views are taken with the purpose of illustrating the methods of construction used.

All Providence construction is Class C.



112 Duct Conduits at Providence, R. I.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.
Illustrating Curve Construction.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT

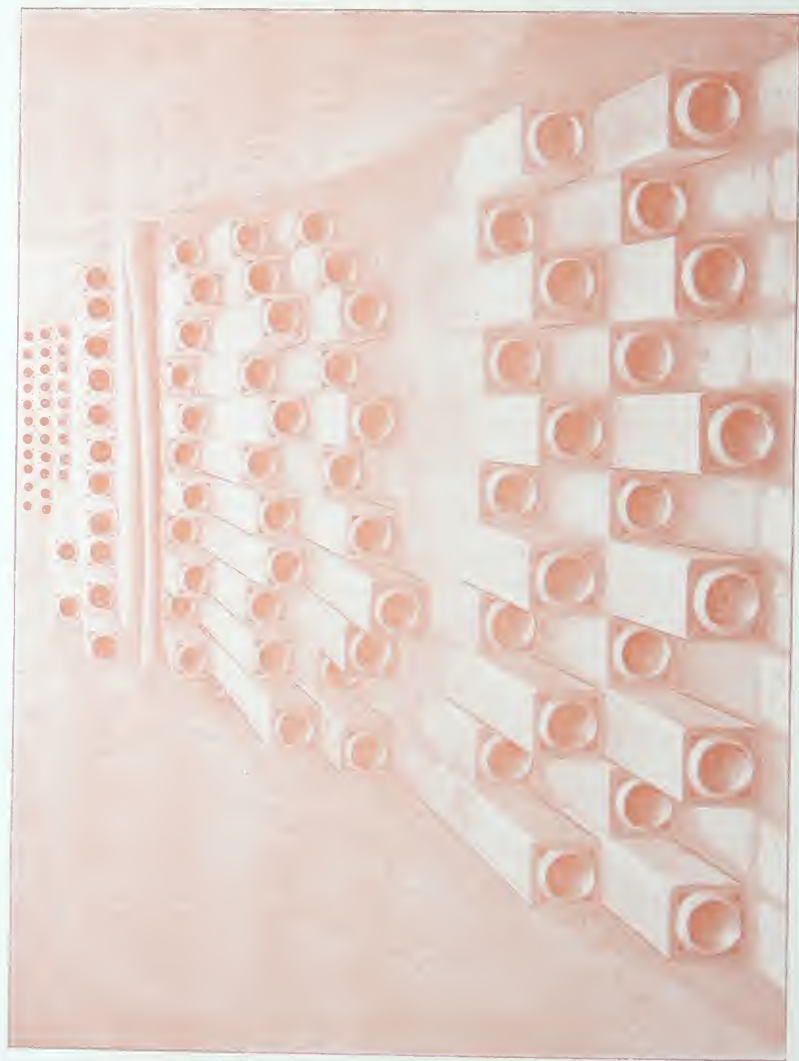


PROVIDENCE, R. I.
Multiple Duct Construction.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.



110 Duct Conduit Line Passing Around Obstructions.

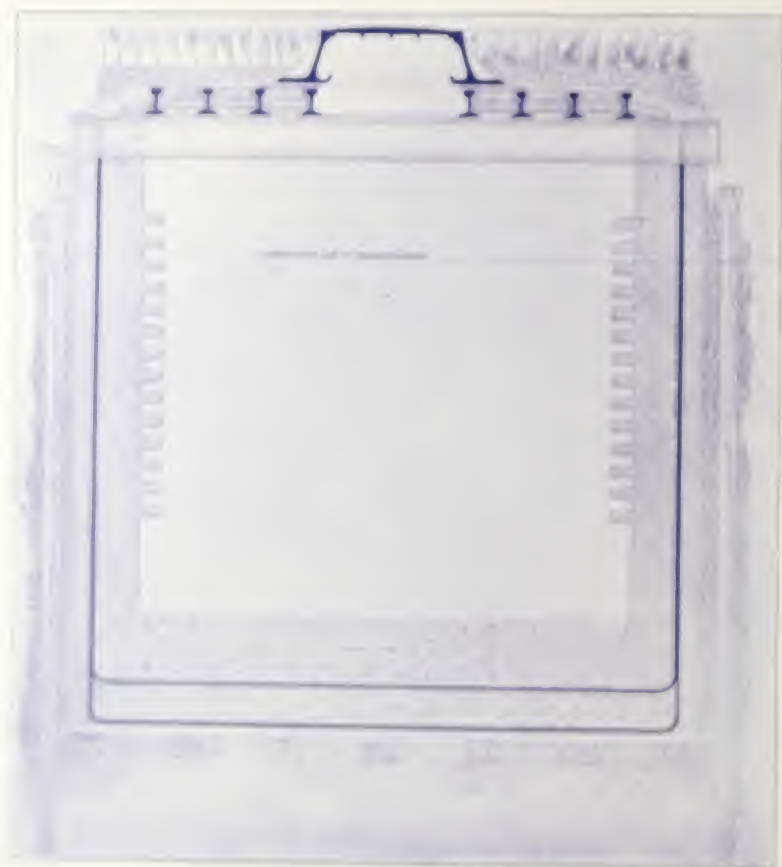
AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.

Showing 306 Conduits Entering Man-hole at Sub-Station.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PROVIDENCE, R. I.

Design of Water-proof Man-hole, by MARK LOWE, Engineer



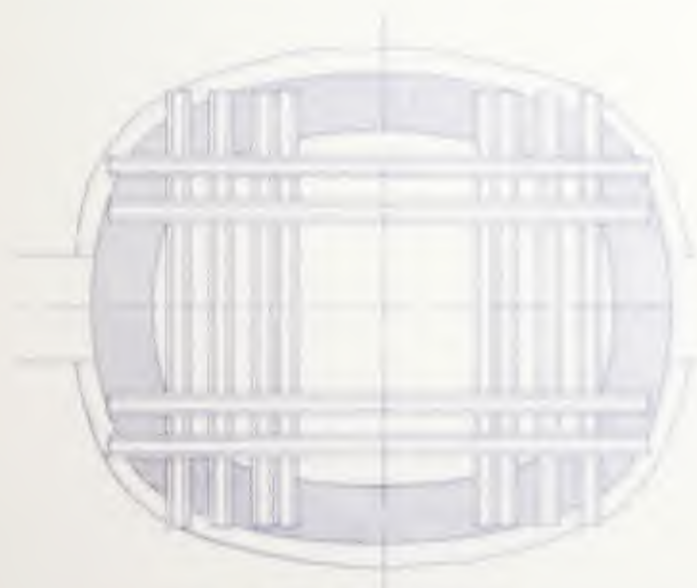
Illustrating Water Proofing of Man-holes.

AMERICAN VITRIFIED CONDUIT CO.



Man-hole Construction.

AMERICAN VITRIFIED CONDUIT CO.



DESIGN OF MAN-HOLES.

Showing details of T Rail and Brick Top Construction.

SHOWING METHOD OF CONSTRUCTION OF MAN-HOLE TOPS.



1 and 2, Illustrate Laying of 1st Course of Rails and Bricks.

SHOWING METHOD OF CONSTRUCTION OF MAN-HOLE TOPS.



3 and 4, Illustrate Laying of 2d Course of Rails and Bricks.

5, Complete, ready for Man-hole Frame.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



NEW ORLEANS, LA.

Edison Electric Co.

Class D. Construction.

General Electric Co., Schenectady, General Contractors.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



PHILADELPHIA, PA.
Penn. Heat, Light and Power Co.
Class A. Construction.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



SAVANNAH, GA.

35 Duct Conduit.

Edison Electric Ill. Co.

Stone & Webster, Boston, Engineers.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



SAVANNAH, GA.

Edison Electric Ill. Co.

Stone & Webster, Boston, Engineers.

CONDUIT SYSTEM
OF
Electric Subway Commission,
CITY OF BALTIMORE.

CHAS. E. PHELPS, CHIEF ENGINEER,

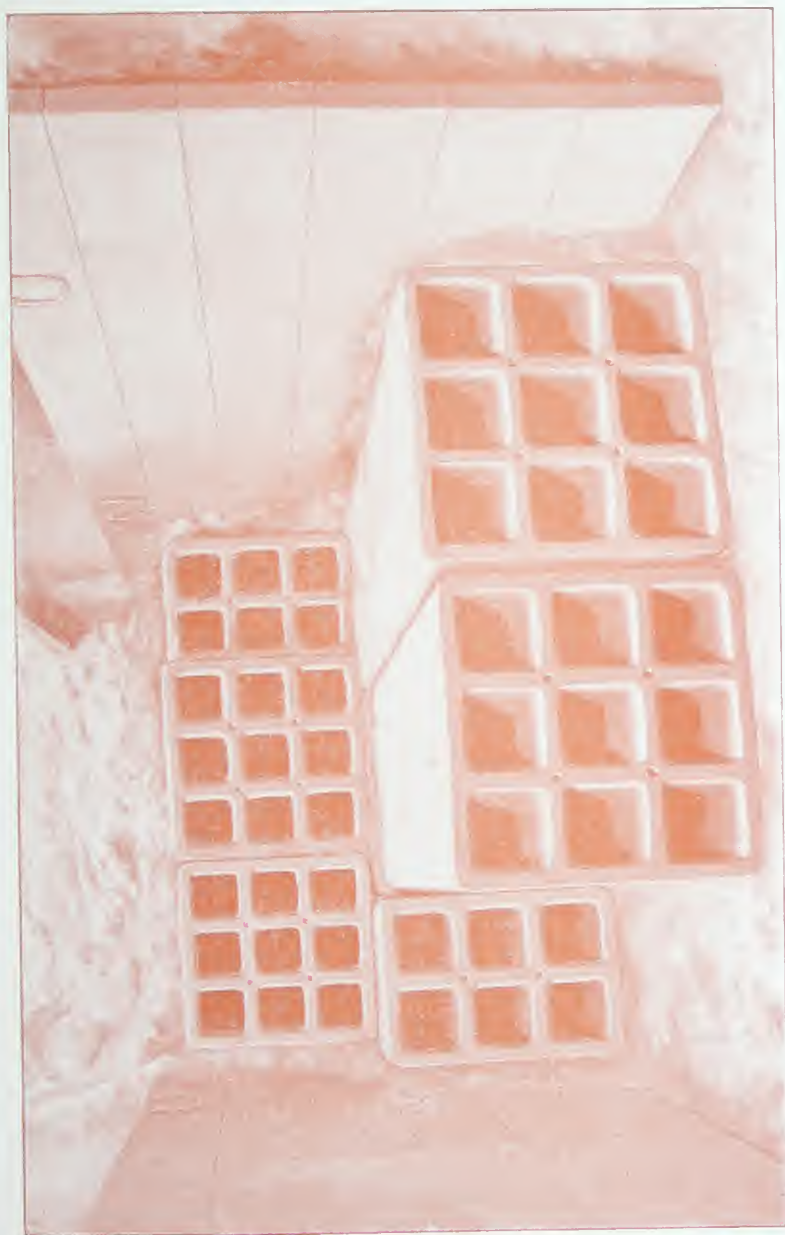
C. G. EDWARDS, ASST. CHIEF ENGINEER.

*AMERICAN VITRIFIED CONDUIT CO., CONTRACTORS
FOR ALL CONDUITS.*

By unanimous vote of the Board of Awards the entire contract was awarded to American Vitrified Conduit Co.

The Subway System now being installed, is the most extensive and complete ever undertaken, and will include Conduits for seventeen different companies, and extend over the entire city.

The details are completely worked out for the trunk lines and local distributing system for all the different systems proposing to occupy these Conduits. Owing to the work only having just commenced, we are unable to illustrate it as fully as it should be.

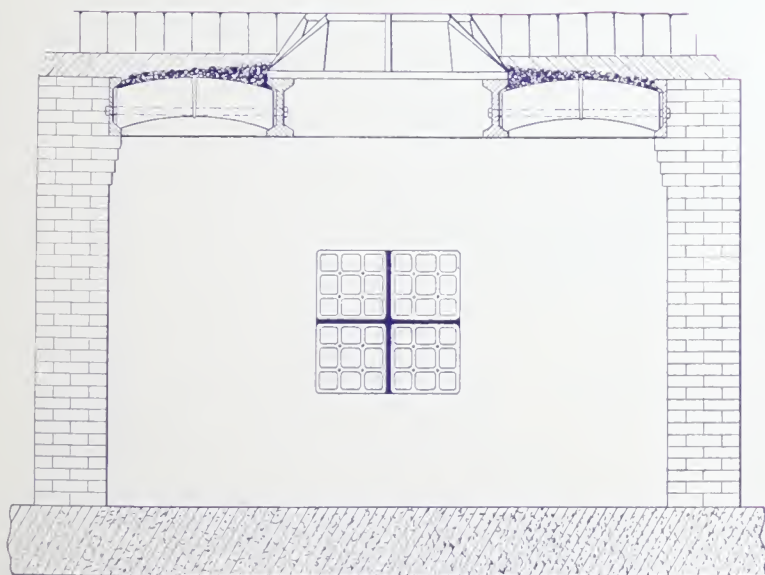


48 Duct Conduit Line of City Subway System.



BALTIMORE, MD.

Illustrating Deep Ditch with Sheet Piling.



BALTIMORE, MD.

36 Ducts Entering Man-hole.

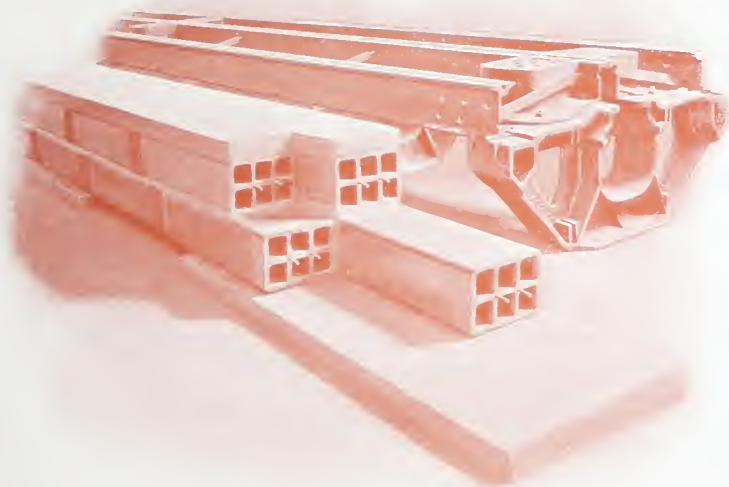
Illustrating Type of Man-hole, with Hollow Tile Arch Brick Tops.

AMERICAN VITRIFIED CONDUIT CO.'S CONDUITS AT



BALTIMORE, MD.

AMERICAN VITRIFIED CONDUIT CO.



Illustrating Underground Trolley Construction.

DISTRIBUTING AND LOCAL SERVICE SYSTEM.

In order to meet the demand for a System of Distribution for Service Connections on a System of Underground Conduits, we have developed in a practical working manner the numerous details of Conduit, Service and Distribution boxes to meet the conditions and requirements thereof.

The illustration on page 49, shows in a somewhat condensed and general manner the use of our various types of service and distribution boxes.

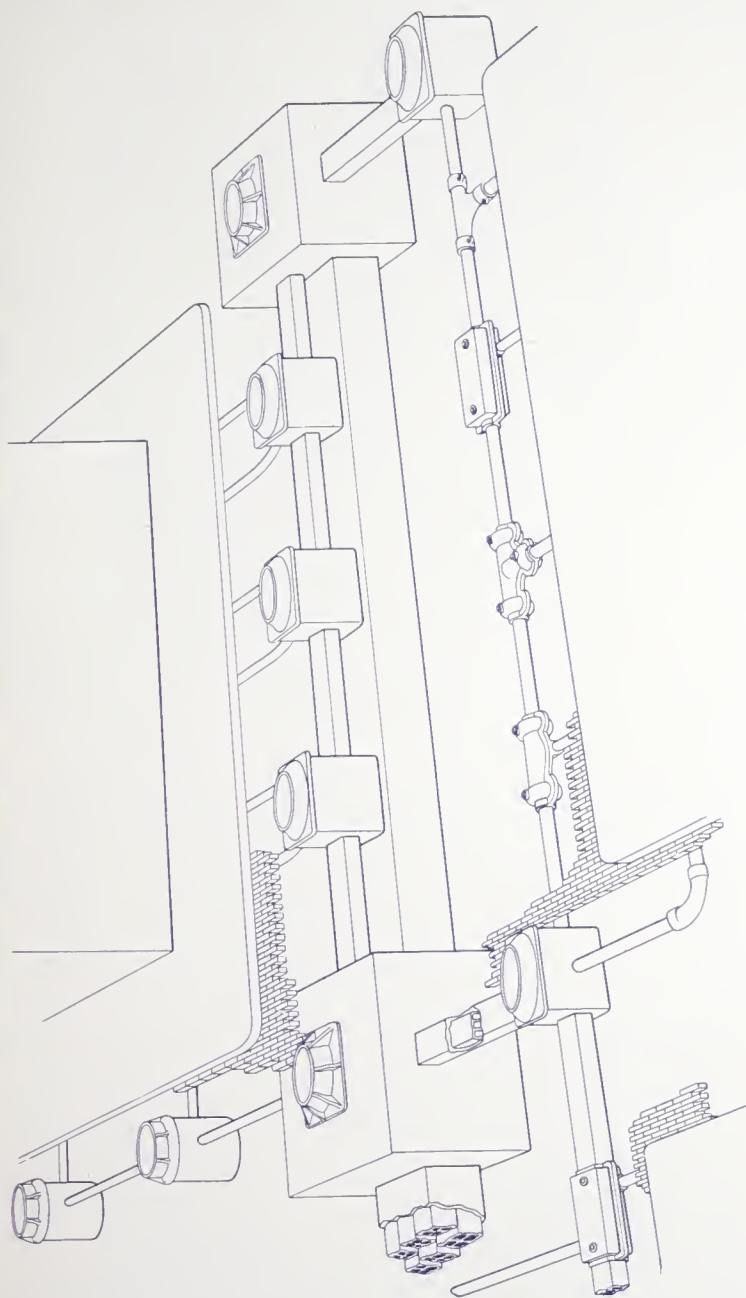
The Service Distribution Boxes with iron surface covers, etc. The boxes shown for this work are Nos. 50 and 51. The No. 50 eighteen inch round service box being specially adapted to a distributing main of one or two duct between man-holes with the service boxes located for every two services, and the joint made from small connecting branch box or wiped joint in the box where it is always accessible from the street service.

Cut No. 51 covers a more extended field and larger use in a system of distributing mains of one, two or three duct Conduits; they are located for every two services, with service branches taken off in Single Socket Tile Conduits as shown.

The services being connected from the mains through a water tight distributing box (Cut No. 61), which are placed in the tile distributing box (Cut No. 51). The Two-Service type is built for this method. This makes the most complete and most accessible method of distribution for Light and Power Central Station work.

Iron and Tile Branch and Service Boxes (Cuts Nos. 52 to 58), are for use in distributing work as shown in drawing, for distribution from local mains with tapped branch lines, or for distribution of services running from man-holes.

We are ready to take up all special conditions of companies having underground distribution to build for light and power work, or for telephone or telegraph work, and advise as to the best method of constructing their system.



PATENT APPLIED FOR.

Illustrating the Methods of Local Service Distribution, with our Different Standard Details.



PATENT APPLIED FOR.

IRON SERVICE BOX FOR SINGLE ROUND SELF-CENTERING
CONDUITS, WITH TWO SERVICES.

Catalogue No. 52.

Price \$



PATENT APPLIED FOR.

IRON SERVICE BOX FOR THREE-WAY CONDUIT, TWO SERVICES.

Catalogue No. 53.

Price \$

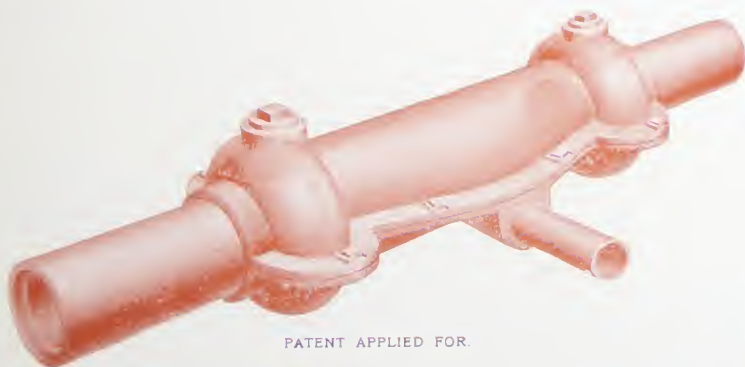


PATENT APPLIED FOR

IRON SERVICE THREE-WAY BOX.

Catalogue No. 54.

Price \$



PATENT APPLIED FOR.

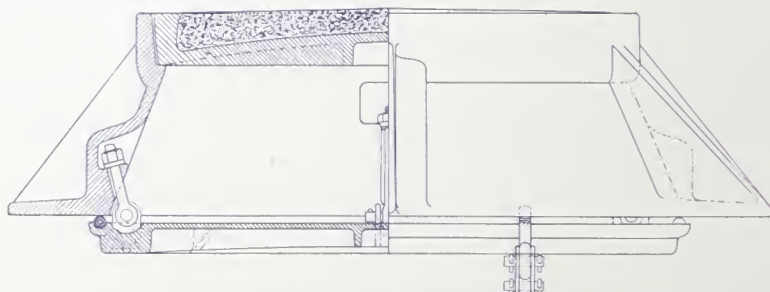
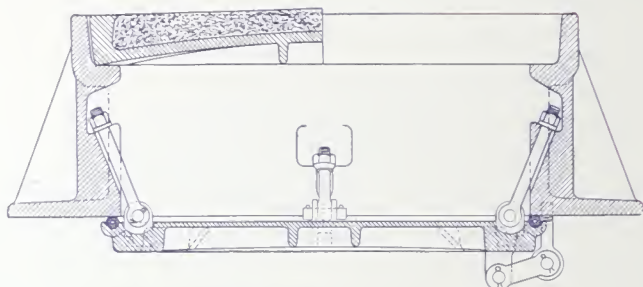
IRON SERVICE BOX WITH IRON PIPE BRANCH.

Catalogue No. 55.

Price.....\$



PATENT APPLIED FOR.



BALTIMORE MAN-HOLE FRAME AND COVER.

DIMENSIONS :

Height, 12 inches.

Flange measurement, 37 x 45 inches.

Outer cover opening, 26 x 23 3/4 inches.

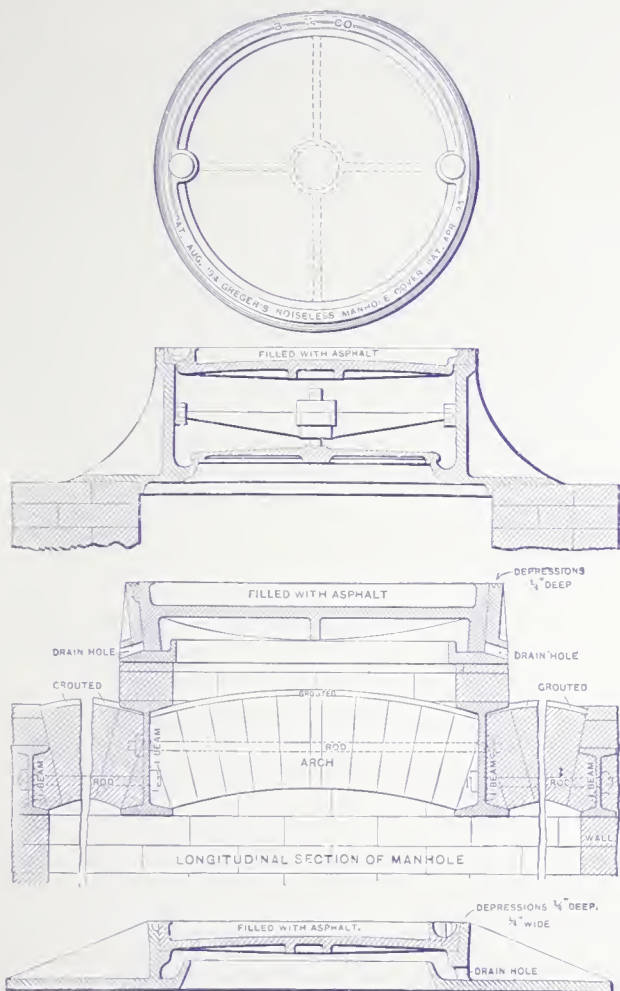
Inner " " 31 x 23 3/4 "

Catalogue No. 60.

Price, Frame and Filled Outer Cover.....\$

" " " Solid " "

Additional on either of above for Inner Hinged Cover with
Fastenings..



"THE GREGER MAN-HOLE COVER."

Made in several different types. Prices on application.

NOISELESS AND VENTILATED COVERS.

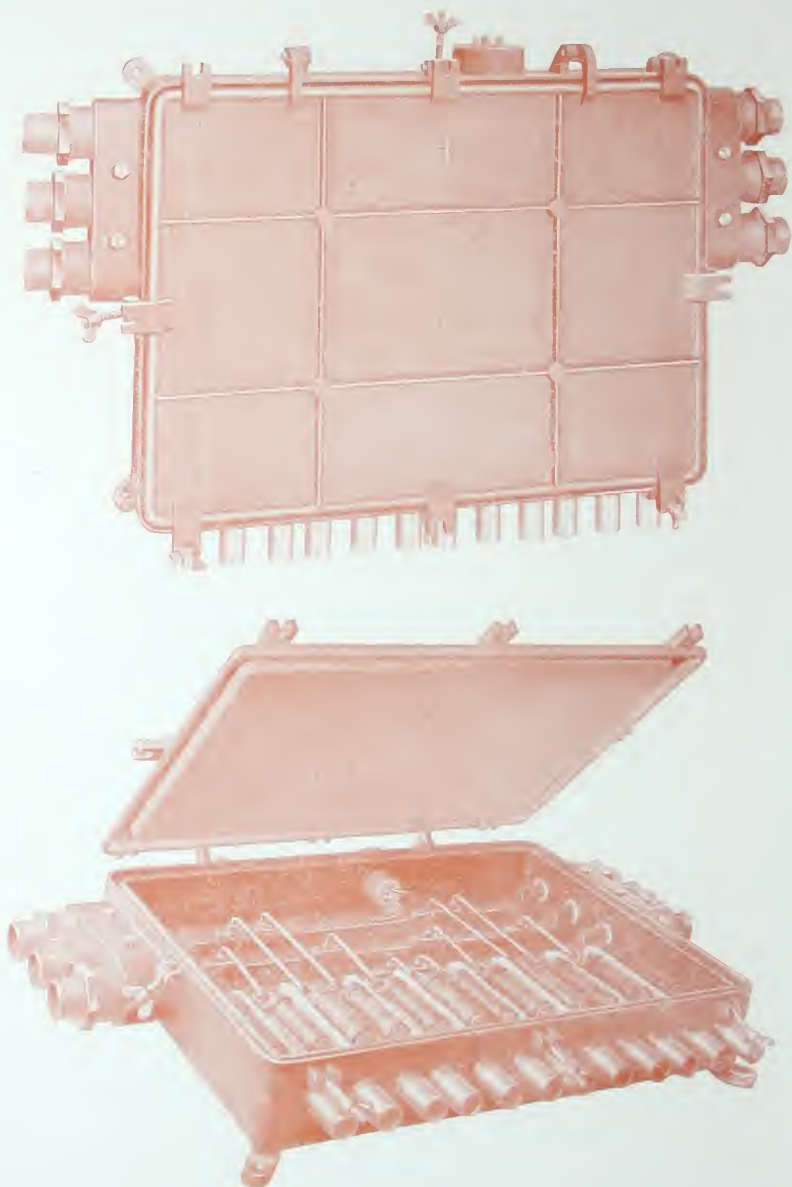
The "Greger" Noiseless Man-hole Cover is the perfect result of extended study and experiment.

It consists of a combination of metal, with a noiseless filling peculiarly adapted for the purpose.

Of the many thousands of Covers placed since their introduction in 1894, not one is known to have been broken.

The "Greger" Cover is entirely noiseless. It is non-slipping (under pedestrian, horse, or bicycle). It will not jump out of place under traffic. It provides for ventilation when desirable.

ADOPTED AS STANDARD IN SEVERAL CITIES.



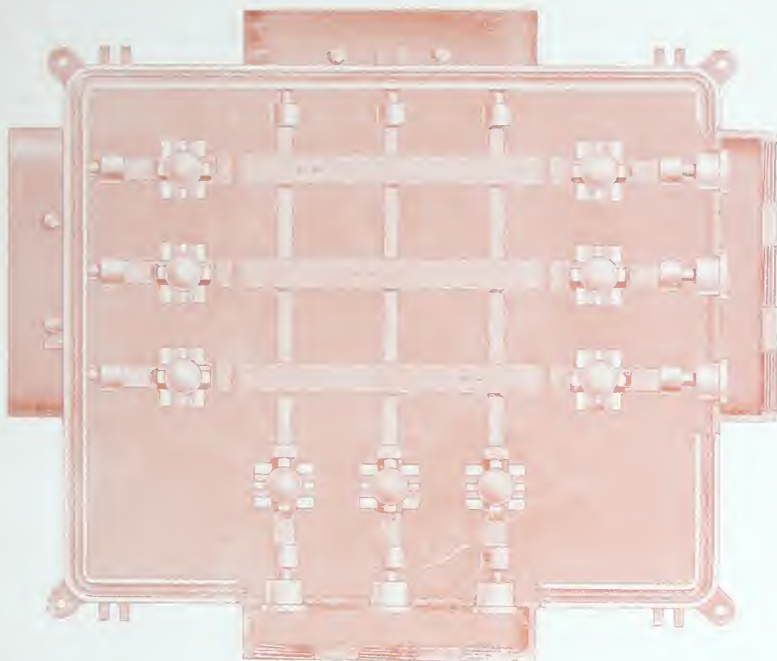
PATENT APPLIED FOR.

DISTRIBUTION BOX FOR SERVICES.

This Box especially adapted for Cable connections in Man-holes or in Tile Service Distributing Box, shown on pages 50 and 51.

Catalogue No. 61.

Price, 4-3-wire Service Box.....	\$
“ 2-3- “ “ “	

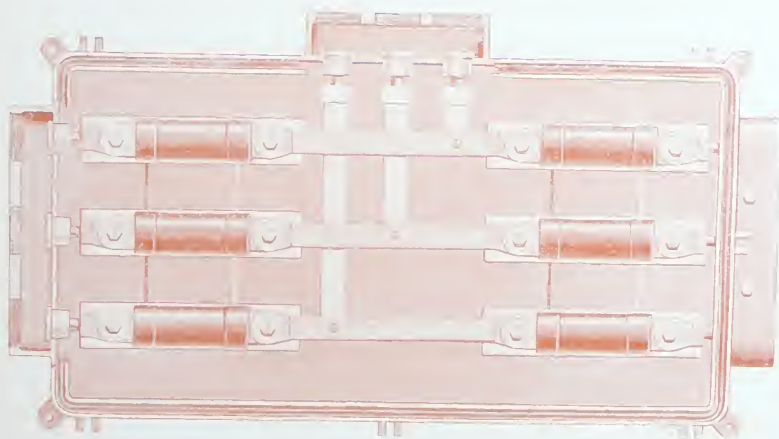


PATENT APPLIED FOR.

CONNECTING BOX FOR MAINS.

Catalogue No. 62.

Price.....\$

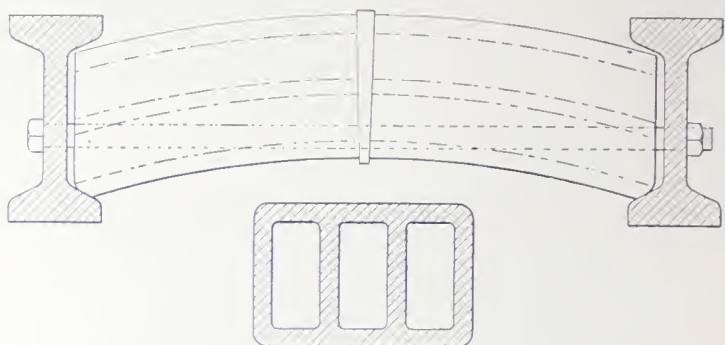


PATENT APPLIED FOR

CONNECTING BOX FOR CONNECTING FEEDERS TO MAINS.

Catalogue No. 63.

Price.....\$



SPECIAL MAN-HOLE ARCH BRICK.

Shell and Walls, 1 inch thick.

Size, 8 x 12 inches.

Standard Spans, 32 x 40 inches.

Wt. Approx., 45 lbs. per foot.

Attention is called to these Semi-Vitrous Hollow Tile Arch Brick, for Man-hole Top Arches. They will stand a load of 10 tons per square foot, with 32 inch span, and are set in place by hand. Adopted as Standard at Baltimore and other cities.

Catalogue No. 64.

Price, per square foot.....\$

SALT GLAZED MAN-HOLE BRICK.

We manufacture a Salt Glazed Brick, for building or lining the walls of man-holes. They are specially adapted for making man-hole walls water-tight and gas-tight.

Catalogue No. 65.

Price, per thousand Brick, \$

BEAMS AND RAILS.

We furnish Iron Beams or Rails for Man-hole Arches.

Prices quoted on application.

CEMENT.

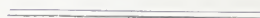
We furnish best brands of Natural (Rosendale) or Portland Cement for Concrete work.

Prices quoted on application.

BURLAP.

We furnish Burlap cut into approximate 6 inch wide strips.

Price, per yard lengths, \$



CHEESE CLOTH.

We furnish Cheese Cloth cut into approximate 6 inch wide strips.

Price, per yard lengths, \$

Our References are our Customers. Among them are:

GENERAL ELECTRIC Co., Schenectady.

EDISON ELECTRIC Co., New Orleans.

UNITED ELECTRIC LIGHT Co., Springfield, Mass.

NARRAGANSETT ELECTRIC LIGHTING Co.,
Providence, R. I.

NEWPORT ILLUMINATING Co., Newport, R. I.

WESTERN UNION TELEGRAPH Co., New York.

PATERSON AND PASSAIC GAS AND ELECTRIC Co.,
Paterson, N. J.

PENNSYLVANIA HEAT, LIGHT AND POWER Co.,
Philadelphia, Pa.

THE HUDSON RIVER POWER TRANSMISSION Co.,
Mechanicville, N. Y.

NATIONAL CONTRACTING Co., and
BARBER ASPHALT PAVING Co., New York.

ELECTRIC SUBWAY COMMISSION,
City of Baltimore, Md.

EDISON ELECTRIC ILLUMINATING Co., Savannah, Ga.

STONE & WEBSTER, Boston, Mass.

Record of Test of American Vitrified Conduit Co.'s
Conduits, with a 12,000 volt multiphase current, operating
General Electric Co.'s Works, Schenectady, from
Mechanicville Power Plant.

THE HUDSON RIVER POWER TRANSMISSION CO.,
MECHANICVILLE, N. Y.,
NEW YORK OFFICE, 11 BROADWAY.

Mechanicville, N. Y., March 5th, 1899.

AMERICAN VITRIFIED CONDUIT CO.,
39-41 Cortlandt Street, New York.
Gentlemen:

I shipped you a day or two ago by express, a piece of three (3) duct Conduit of your make, such as we used in our underground construction in Schenectady, upon which I have made some high voltage tests in accordance with your recent request.

In the first test I stretched a piece of ten ampere fuse wire from one end of the section to the other, the terminals holding the fuse being connected directly across our 12,000 volt mains, the fuse thus acting as a short circuit across our line. Upon closing the circuit the fuse was melted almost instantly, an arc being held in air for a few seconds, and then dying out as the distance was too great to hold the arc continuously.

I then placed the two terminals about six inches apart, and both at one end of the piece of tile. Between these two terminals I placed a piece of ten ampere fuse wire connecting them as before to our 12,000 volt line. This time upon closing the circuit the fuse blew instantly and an arc held between the two terminals, the flame playing in the air between the tops of the bolt heads as they will show. Upon opening the circuit the arc died, of course, and upon closing it again there was no sign of leakage across the Conduit. The material of which this is constructed is evidently a first-class insulator.

I would state that our Conduit in Schenectady is carrying three lead covered cables of a three phase circuit running at 12,000 volts. It was installed during the month of July, 1898, and since then this circuit has been operated continuously at the above potential, we having had absolutely no trouble in our Conduits. We can, therefore, say that this material has proven itself in every way satisfactory.

Yours truly,

THE HUDSON RIVER POWER TRANSMISSION CO.,
By E. J. RICHARDS,
ELECTRICIAN.







CARROL J. POST, JR.,
ENGRAVER & PRINTER
5 CHAMBERS ST.,
NEW YORK.